Mossbauer Effect Measurement of Intermetallic Compounds in Iron-Tin System : Fe_5Sn_3 and FeSn

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Abstract

Hyperfine fields for an Fe atom in intermetallic compounds, Fe_5Sn_3 and FeSn, have been investigated by using the Mössbauer effect. The hyperfine field of Fe_5Sn_3 with hexagonal $B8_2$-type structure is 187kOe on 2(a) sites while that on 2(d) sites has two values, 247kOe and 208kOe, at liquid-air temperature. The $B8_2$-type structure of Fe_5Sn_3 is stable above 760°C and the magnetic Curie temperature is (280°±5°)C. FeSn of hexagonal B35-type is antiferromagnetic with the Néel temperature at 97°C and the hyperfine field is 163kOe on an Fe site at liquid-air temperature.

Temperature dependence of hyperfine field, isomer shift and quadrupole interaction was also studied.

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